

AMENDMENTS TO THE CLAIMS

1. (Previously Presented) A liquid crystal display device which carries out emphasis conversion on video data supplied to a liquid crystal display panel in accordance with at least video data of previous vertical period and video data of current vertical period, thereby compensating for optical response properties of the liquid crystal display panel,
the liquid crystal display device comprising:

I/P conversion means which, when incoming video data is an interlaced signal, converts the interlaced signal into a progressive signal in accordance with any one of two or more conversion methods; and

emphasis conversion means which carries out emphasis conversion on video data of current vertical period so as to emphasize grayscale transition at least from previous vertical period to current vertical period in the progressive signal,

wherein a degree of the emphasis conversion on the video data is controlled so as to be changed in accordance with which kind of conversion method among the two or more conversion methods is used for the conversion.

2. (Original) The liquid crystal display device according to claim 1, further comprising:

table memory which stores an emphasis conversion parameter determined by video data of current vertical period and video data of previous vertical period,

the emphasis conversion means having:

an operation section which performs emphasis operation on the video data by using the emphasis conversion parameter; and

a multiplying section which multiplies output data obtained by the emphasis operation by a coefficient varying depending upon which kind of conversion method among the two or more conversion methods is used for the conversion.

3. (Original) The liquid crystal display device according to claim 1, further comprising:
 - table memory which is referenced to when incoming video data is converted by a first conversion method, and stores an emphasis conversion parameter determined by video data of current vertical period and video data of previous vertical period; and
 - table memory which is referenced to when incoming video data is converted by a second conversion method, and stores an emphasis conversion parameter determined by video data of current vertical period and video data of previous vertical period,

the emphasis conversion means having:

an operation section which performs emphasis operation on the video data obtained by the conversion by using the emphasis conversion parameter which is read from the table memory determined by which kind of conversion method among the two or more conversion methods is used for the conversion.
4. (Original) The liquid crystal display device according to claim 1, further comprising:
 - temperature detection means which detects a device internal temperature,
 - the emphasis conversion means changing the degree of emphasis conversion performed on the video data in accordance with a detection result of the device internal temperature.

5. (Original) The liquid crystal display device according to claim 4, further comprising:
table memory which stores an emphasis conversion parameter determined by video data
of current vertical period and video data of previous vertical period,
the emphasis conversion means having:
an operation section which performs emphasis operation on the video data obtained by
the conversion, by using the emphasis conversion parameter; and
a multiplying section which multiplies output data supplied from the operation section by
a coefficient varying depending upon (i) which kind of conversion method among the two or
more conversion methods is used for the conversion and (ii) a detection result of the device
internal temperature.

6. (Original) The liquid crystal display device according to claim 4, further comprising:
table memory which is referenced to when incoming video data is converted by a first
conversion method, and stores an emphasis conversion parameter determined by video data of
current vertical period and video data of previous vertical period; and
table memory which is referenced to when incoming video data is converted by a second
conversion method, and stores an emphasis conversion parameter determined by video data of
current vertical period and video data of previous vertical period,
the emphasis conversion means having:
an operation section which performs emphasis operation on the video data obtained by
the conversion by using the emphasis conversion parameter which is read from the table memory

determined by which kind of conversion method among the two or more conversion methods is used for the conversion; and

 a multiplying section which multiplies output data obtained by the emphasis operation by a coefficient varying depending upon a detection result of the device internal temperature.

7. (Original) The liquid crystal display device according to claim 4, further comprising:
 table memories which are referenced to when incoming video data is converted by a first conversion method, and store emphasis conversion parameters respectively associated with a plurality of device internal temperatures, the emphasis conversion parameters each being determined by video data of current vertical period and video data of previous vertical period;
 and

 table memories which are referenced to when incoming video data is converted by a second conversion method, and store emphasis conversion parameters respectively associated with a plurality of device internal temperatures, the emphasis conversion parameters each being determined by video data of current vertical period and video data of previous vertical period,

 the emphasis conversion means having:

 an operation section which performs emphasis operation on the video data obtained by the conversion by using the emphasis conversion parameter which is read from the table memory determined by (i) which kind of conversion method among the two or more conversion methods is used for the conversion and (ii) a detection result of the device internal temperature.

8. (Original) The liquid crystal display device according to claim 4, further comprising:
table memories which store emphasis conversion parameters respectively associated with
a plurality of device internal temperatures, the emphasis conversion parameters each being
determined by video data of current vertical period and video data of previous vertical period;
and

the emphasis conversion means having:

an operation section which performs emphasis operation on the video data obtained by
the conversion by using the emphasis conversion parameter which is read from the table memory
determined by a result of comparison between (i) a switching temperature determined by which
kind of conversion method among the two or more conversion methods is used for the
conversion and (ii) a detection result of the device internal temperature.

9. (Original) The liquid crystal display device according to claim 8, further comprising:

an operation section which performs a predetermined operation on temperature data that
is the detection result of the device internal temperature, the operation being determined for each
of the two or more conversion methods;

a comparison section which compares between the temperature data having been
subjected to the operation and given threshold temperature data determined in advance; and

a control signal output section which generates a switching control signal for controlling
switching of the emphasis conversion parameters, in accordance with a result of the comparison.

10. (Original) The liquid crystal display device according to claim 8, further comprising:
a comparison section which compares between temperature data that is the detection result of the device internal temperature and a given threshold temperature data determined for each of the two or more conversion methods; and
a control signal output section which generates a switching control signal for controlling switching of the emphasis conversion parameters, in accordance with a result of the comparison.

11. (Original) A signal processing unit for use in a liquid crystal display device, the signal processing unit comprising:
conversion means which converts an interlaced video signal into a progressive video signal; and
correction means which corrects a video signal of current vertical period so as to emphasize grayscale transition at least from previous vertical period to current vertical period in the progressive video signal,
wherein the conversion means is capable of conversions by two or more conversion methods, and
a degree of the grayscale transition emphasis performed by the correction means is changed in accordance with a conversion method used by the conversion means.

12. (Original) The signal processing unit for use in a liquid crystal display device according to claim 11, wherein:

the two or more conversion methods include a first conversion method of performing motion detection between fields and a second conversion method of performing conversion in a given procedure regardless of presence or absence of motion between fields, and

in a case where the conversion means performs conversion by the second conversion method, a degree of grayscale transition emphasis performed by the correction means is changed to be lower than in a case where the conversion means performs conversion by the first conversion method.

13. (Original) The signal processing unit for use in a liquid crystal display device according to claim 11, wherein:

the two or more conversion methods include a first conversion method of performing conversion by motion prediction between fields and a second conversion method of performing conversion in a given procedure regardless of presence or absence of motion between fields, and

in a case where the conversion means performs conversion by the second conversion method, a degree of grayscale transition emphasis performed by the correction means is changed to be lower than in a case where the conversion means performs conversion by the first conversion method.

14. (Original) The signal processing unit for use in a liquid crystal display device according to claim 11, wherein:

the two or more conversion methods include a first conversion method of referencing to a video signal of other field for conversion and a second conversion method of not referencing to a video signal of other field for conversion, and

in a case where the conversion means performs conversion by the second conversion method, a degree of grayscale transition emphasis performed by the correction means is changed to be lower than in a case where the conversion means performs conversion by the first conversion method.

15. (Previously presented) The signal processing unit for use in a liquid crystal display device according to claim 12, wherein:

the second conversion method is a method of copying a video signal in a certain field, or averaging sets of video signals in a certain field or averaging sets of video signals in a certain field while being weighted, so as to convert the video signal in the field into a progressive video signal.

16. (previously presented) The signal processing unit for use in a liquid crystal display device according to claim 11, wherein:

the correction means includes a plurality of table memories each of which stores emphasis conversion parameter determined by at least the video signal of previous vertical period and the video signal of current vertical period, and

the table memories referenced to by the correction means are switched in accordance with a conversion method used by the conversion means, so that the degree of the grayscale transition emphasis is changed.

17. (previously presented) The signal processing unit for use in a liquid crystal display device according to claim 11, wherein:

the correction means includes: a table memory which stores an emphasis conversion parameter determined by at least the video signal of previous vertical period and the video signal of current vertical period; and adjustment means which adjusts a correction amount for the video signal of current vertical period in accordance with the degree of grayscale transition emphasis, the correction amount being determined with reference to the table memory.

18. (previously presented) The signal processing unit for use in a liquid crystal display device according to claim 11, wherein:

the degree of grayscale transition emphasis performed by the correction means is changed in accordance with not only the conversion method used by the conversion means but also a device internal temperature.

19. (Original) The signal processing unit for use in a liquid crystal display device according to claim 18, wherein:

the correction means includes a plurality of table memories each of which stores emphasis conversion parameter determined by at least the video signal of previous vertical period and the video signal of current vertical period, and

the table memories referenced to by the correction means are switched in accordance with (a) a conversion method used by the conversion means and (b) a device internal temperature, so that the degree of the grayscale transition emphasis is changed.

20. (Original) The signal processing unit for use in a liquid crystal display device according to claim 18, wherein:

the correction means includes a plurality of table memories each of which stores an emphasis conversion parameter determined by at least the video signal of previous vertical period and the video signal of current vertical period,

the correction means further includes adjustment means which adjusts a correction amount for the video signal of current vertical period, the correction amount being determined with reference to any one of the table memories, and

a degree of the adjustment performed by the adjustment means is changed in accordance with a device internal temperature, and the table memories referenced to by the correction means are switched in accordance with a conversion method used by the conversion means, so that the degree of the grayscale transition emphasis is changed.

21. (Original) The signal processing unit for use in a liquid crystal display device according to claim 18, wherein:

the correction means includes a plurality of table memories each of which stores an emphasis conversion parameter determined by at least the video signal of previous vertical period and the video signal of current vertical period,

at least part of the table memories are shared between the two or more conversion methods used by the conversion means, and

the table memories referenced to by the correction means are switched in accordance with a device internal temperature, and switching temperatures for switching between the table memories are changed in accordance with a conversion method used by the conversion means, so that the degree of the grayscale transition emphasis is changed.

22. (Original) The signal processing unit for use in a liquid crystal display device according to claim 21, wherein:

the table memories are switched in such a manner that part of the table memories is referenced to only when the conversion means performs conversion by a particular conversion method.

23. (Original) A signal processing unit for use in a liquid crystal display device, the signal processing unit including conversion means which converts an interlaced video signal into a progressive video signal and modulating the progressive video signal so as to emphasize grayscale transition in each pixel of the liquid crystal display device,

wherein the conversion means is capable of conversions by two or more conversion methods, and

a degree of the grayscale transition emphasis is changed in accordance with a conversion method used by the conversion means.

24. (previously presented) A liquid crystal display device including the signal processing unit according to claim 11.

25. (Previously Presented) A liquid crystal display device having an I/P conversion means which, when incoming video data is an interlaced signal, converts the interlaced signal into a progressive signal in accordance with any one of two or more conversion methods,

said liquid crystal display device, carrying out emphasis conversion on video data supplied to a liquid crystal display panel in accordance with at least video data of previous vertical period and video data of current vertical period, so as to emphasize grayscale transition at least from previous vertical period to current vertical period in the progressive signal, thereby compensating for optical response properties of the liquid crystal display panel, and

controlling a degree of the emphasis conversion on the video data so as to be changed in accordance with which kind of conversion method among the two or more conversion methods is used for the conversion.

26. (Previously Presented) A program causing a computer to execute a process of controlling a degree of emphasis conversion on video data so as to be changed in accordance with which kind of conversion method among two or more conversion methods is used for the conversion,

the computer controlling a liquid crystal display device comprising: an I/P conversion means which, when incoming video data is an interlaced signal, converts the interlaced signal into a progressive signal in accordance with any one of two or more conversion methods; and emphasis conversion means which carries out emphasis conversion on video data of current vertical period so as to emphasize grayscale transition at least from previous vertical period to current vertical period in the progressive signal, and the liquid crystal display device carrying out emphasis conversion on video data supplied to a liquid crystal display panel in accordance with at least video data of previous vertical period and video data of current vertical period, thereby compensating for optical response properties of the liquid crystal display panel.

27. (Original) A program causing a computer comprising:
conversion means which converts an interlaced video signal into a progressive video signal; and
correction means which corrects a video signal of a current vertical period so as to emphasize grayscale transition at least from current vertical period to previous vertical period in the progressive video signal, wherein the conversion means is capable of conversions by two or more conversion methods,
to operate so as to change a degree of grayscale transition emphasis performed by the correction means in accordance with a conversion method used by the conversion means.

28. (previously presented) A storage medium storing the program according to claim 26.

29. (Previously Presented) A liquid crystal display control method of carrying out emphasis conversion on video data supplied to a liquid crystal display panel in accordance with at least video data of previous vertical period and video data of current vertical period, thereby compensating for optical response properties of the liquid crystal display panel,

the method comprising the steps of:

when incoming video data is an interlaced signal, converting the interlaced signal into a progressive signal in accordance with any one of two or more conversion methods; and

carrying out emphasis conversion on video data of the current vertical period so as to emphasize grayscale transition at least from previous vertical period to current vertical period in the progressive signal,

wherein a degree of the emphasis conversion on the video data is controlled so as to be changed in accordance with which kind of conversion method among the two or more conversion methods is used for the conversion.

30. (Previously Presented) A liquid crystal display control method comprising:

a conversion step of converting an interlaced video signal into a progressive video signal;

and

a correction step of correcting a video signal of current vertical period so as to emphasize grayscale transition at least from current vertical period to previous vertical period in the progressive video signal,

wherein conversions by two or more conversion methods are possible in the conversion

step,

the method further comprising:
a control step of changing a degree of the grayscale transition emphasis performed in the correction step in accordance with a conversion method used in the conversion step.

31. (Original) A liquid crystal display control method of including a conversion step of converting an interlaced video signal into a progressive video signal, and modulating the progressive video signal so as to emphasize grayscale transition in each pixel of a liquid crystal display device,

wherein conversions by two or more conversion methods are possible in the conversion step, and

a degree of the grayscale transition emphasis is changed in accordance with a conversion method used in the conversion step.

32. (Previously Presented) A liquid crystal display control method including an I/P conversion step of, when incoming video data is an interlaced signal, converting the interlaced signal into a progressive signal in accordance with any one of two or more conversion methods, said method carrying out emphasis conversion on video data supplied to a liquid crystal display panel in accordance with at least video data of previous vertical period and video data of current vertical period, so as to emphasize grayscale transition at least from previous vertical period to current vertical period in the progressive signal, thereby compensating for optical response properties of the liquid crystal display panel, wherein

a degree of the emphasis conversion on the video data is controlled so as to be changed in accordance with which kind of conversion method among the two or more conversion methods is used for the conversion.

33. (New) The signal processing unit for use in a liquid crystal display device according to claim 13, wherein:

the second conversion method is a method of copying a video signal in a certain field, or averaging sets of video signals in a certain field or averaging sets of video signals in a certain field while being weighted, so as to convert the video signal in the field into a progressive video signal.

34. (New) The signal processing unit for use in a liquid crystal display device according to claim 14, wherein:

the second conversion method is a method of copying a video signal in a certain field, or averaging sets of video signals in a certain field or averaging sets of video signals in a certain field while being weighted, so as to convert the video signal in the field into a progressive video signal.

35. (New) A liquid crystal display device including the signal processing unit according to claim 23.

36. (New) A storage medium storing the program according to claim 27.